CLAIMS

1. A method for the modification of an inner surface in each of one, two or more microchannel structures of a microfluidic device, each of the microchannel structures comprises one, two or more ports (PT) communicating with ambient atmosphere, said method comprising for each of the microchannel structures the steps of:
   (I) filling a microconduit part that comprises the inner surface to be modified with a liquid containing a surface modification agent (surface-modifying liquid) through at least one port (PT') of said two or more ports (PT),
   (II) incubating said liquid within said microconduit part, and
   (III) removing said liquid from said microconduit part, for instance from the microchannel structures comprising said microconduit part,

   characterized in that reduced pressure is utilized for filling in step (I).

2. The method according to claim 1, **characterized** in that said microfluidic device comprises two or more microchannel structures that comprises the inner surface to be modified, and that at least one of steps (I)-(III) is carried out in parallel for said two or more microchannel structures.

3. The method according to claims 1-2, **characterized** in that for each of said microchannel microchannel structures
   (a) there are at least one port communicating with one end of the microconduit part (PT_1 ports) and at least one other port communicating with the other end of the microconduit part (PT_2 ports), and
   (b) the surface-modifying liquid being sucked through one or more of the PT_1 ports by applying reduced pressure through one or more of the PT_2 ports while keeping remaining ports closed.

4. The method according to any of claims 1-2, **characterized** in that it comprises the steps of:
   i) providing
      A) a closed vessel that contains a liquid phase which contains the surface modification agent, and a gas phase, and

B) said microfluidic device in which each of said microchannel structures is empty and via said at least one port (PT') is in contact with a) said liquid phase, or b) said gas phase, while the remaining ports, if any, are closed;

ii) reducing the gas pressure in said vessel,

iii) bringing said at least one port in contact with said liquid phase if step (i) is according to alternative (b),

iv) increasing the gas pressure in the vessel, typically to atmospheric pressure, whereupon said liquid is entering each of said microchannel structures through said at least one port (PT') during

- step (ii) for alternative (a), and
- step (iv) for alternative (b).

5. The method according to claim 4, **characterized** in that a) that step (ii), step (iii) if present, and step (iv) are carried out while the microfluidic device is placed within said vessel.

6. The method according to any of claims 4, **characterized** in that steps (ii)-(iv) are carried out with at least a major portion of each of said microchannel structures being placed outside said vessel while said at least one inlet port (PT') is communicating with the interior of said vessel.

7. The method according to any of claims 4-6, **characterized** in that one or more of said at least one port (PT') is one end of a capillary tube attached at its other end to a major body that comprises at least the major part of each of the microchannel structures.

8. The method according to any of claims 4-7, **characterized** in that (a) said microfluidic device during step (I) is placed in a holder which is capable of holding a plurality of said microfluidic device.

9. The method according to any of claims 1-8, **characterized** in that, for each of said microchannel structure, step (III) comprises evaporating via at least one port (PT'') of said two or more ports (PT) at least partially the liquid introduced into said microconduit part in step (I), for instance by application of reduced pressure, an air stream and/or heat to at least one port (PT''') which typically is PT''.

10. The method according to any of claims 1-9, **characterized** in that, for each of said microchannel structures, step (III) comprises at least partially removing through at least one port (PT''') of said ports (PT) the liquid introduced into said microconduit part in step (I), said removing encompassing replacing said liquid with a fluid selected amongst gases and liquids.

11. The method according to any of claims 1-10, **characterized** in that
    A) said microfluidic device permits the use of centrifugal force for said removal (step III), and
    B) said removal (step III) comprises the steps of:
        a) transferring said microfluidic device to a centrifugal device adapted to create the centrifugal force required for said removal,
        b) centrifuging said microfluidic device, typically while it is retained in a holder which is capable of holding a plurality of said microfluidic device, and
        c) optionally drying the interior of said one or more microchannel structures by evaporation from at least one of said one or more inlet and outlet ports, preferably while said microfluidic device is retained on a holder which is capable of holding a plurality of said microfluidic device.

12. The method according to any of claims 1-11, **characterized** in that the method is repeated once, twice or more times with said microfluidic device with the liquid used in step (I) having the same or different composition as the liquid used in a previous round.

13. The method according to claim 12, **characterized** in that the liquid used in step (I) of a repetitive round is selected amongst a) liquids containing a surface modification agent that is of the same or different kind or concentration as the surface modification agent of the first round, b) washing liquids, and c) conditioning liquids.

14. The method according to any of claims 1-13, **characterized** in that
    a) said liquid of step (I) in the first round or in a repetitive round contains an analyte to be determined in a process to be carried out within each of said microchannel structures, and

b) each of said microchannel structures comprises on said inner surface a capturing function for retaining said analyte.

15. The method according to any of claims 1-13, **characterized** in that
   a) said liquid of step (I) in the first round or in a repetitive round contains a reagent or reactant to be used in a process to be carried out within each of said microchannel structures,
   b) each of said microchannel structures comprises in said inner surface a capturing function for retaining said reactant or reagent.

16. The method according to any of claims 1-13, **characterized** in that
   a) said liquid of step (I) in the first round or in a repetitive round is a dispersion of particles,
   b) each of said microchannel structures comprises in said microconduit part a capturing function for retaining said particles.

17. The method according to any of claims 1-16, **characterized** in that said liquid of step (I) in the first round or in a repetitive round has a boiling point at atmospheric pressure that is $\geq 70°C$, preferably $\geq 80°C$.

18. The method according to any of claims 1-17, **characterized** in that step (I) comprises the steps of:
   a) providing a plurality of said microfluidic device, and
   b) processing the microfluidic devices of said plurality in parallel according to steps (I)-(III) with preference for carrying out step (I) as described in claim 4 or in any of its dependent subclaims.